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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,764	01/29/2004	Max F. Hineman	2269-5925US (03-0290.00/U	5543

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EXAMINER	
QUINTO, KEVIN V	

ART UNIT	PAPER NUMBER
2826	

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/767,764	HINEMAN ET AL.
	Examiner	Art Unit
	Kevin Quinto	2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-25* is/are allowed.

6)☒ Claim(s) *26-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 26-33 have been considered but are moot in view of the new ground(s) of rejection.

2. The examiner notes the newly amended title and thus hereby withdraws the objection made to the specification in the previous Office action.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 26, 27, 31, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Aoki et al. (USPN 6,465,352 B1).

5. In reference to claims 26 and 31, by Aoki et al. (USPN 6,465,352 B1, hereinafter referred to as the "Aoki" reference) discloses a similar structure. Figures 7A-7F and 8A-8H of Aoki each illustrate a damascene structure which meets claims 26 and 31. A damascene opening is formed to expose a metallic layer (3) in a damascene structure. A metallic plug (22) is formed in the damascene opening such that it is in electrical connection with the metallic layer (3). The examiner notes the limitation regarding the

use of oxidizing agents and a reducing plasma. However this places claims 26 and 31 into the form of **product-by-process claims**:

> Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Thorpe*, 227 USPQ 964, 966; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi* et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in " product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 2113.

Claims 26 and 31 do not distinguish over the Aoki references regardless of the process used to form the damascene opening, because only the final product is relevant, and not the process of making such as using an oxidizing agent to cause an oxidation injury and exposing the metallic layer to a reducing plasma.

6. With regard to claims 27 and 32, Aoki discloses that the metallic damascene structures of figures 7A-7F and 8A-8H are to be used in an electronic device (column 8, lines 51-57; column 10, lines 45-49).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over of Aoki et al. (USPN 6,465,352 B1) in view of Kitani (USPN 6,424,042 B1) and further in view of Oashi et al. (United States Patent Application Publication No. US 2002/0030215 A1).

9. With regard to claim 28, Aoki does not disclose the use of the damascene structure in a memory device. However the use of damascene structures in memory devices is well known in the art. Kitani (USPN 6,424,042 B1) discloses that using damascene structures in memory devices has the benefit of providing an increased operation speed (column 1, lines 14-19). Oashi et al. (United States Patent Application Publication No. US 2002/0030215 A1, hereinafter referred to as the "Oashi" reference) discloses that a faster operation speed is a known goal in the art (p.1, paragraph 5). In view of Kitani and Oashi, it would therefore be obvious to implement the damascene structure of Aoki in a memory device.

10. Claims 29, 30, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (USPN 6,885,080 B2) in view of Oashi et al. (United States Patent Application Publication No. US 2002/0030215 A1).

11. In reference to claims 29, 30, and 33, Chen et al. (USPN 6,885,080 B2, hereinafter referred to as the "Chen" reference) discloses an electronic device with a microprocessor and an embedded dynamic random access memory (DRAM) or integrated circuit coupled to it on the same substrate (column 1, lines 12-16). Chen does not disclose the use of damascene structures for DRAM. However the use of damascene structures in a DRAM is well known in the art. Oashi (United States Patent Application Publication No. US 2002/0030215 A1) discloses a DRAM with damascene structures in figure 22. Oashi discloses that such a DRAM has a small size (p.1, paragraph 22) which is desirable in the art (p.2, paragraph 7). In view of Oashi, it would therefore be obvious to implement a DRAM with damascene structures in the

electronic device of Chen. The examiner notes the limitation regarding the use of oxidizing agents and a reducing plasma. However this places claims 29, 30, and 33 into the form of **product-by-process claims**:

> Note that a "product by process" claim is directed to the product per se, no matter how actually made, *In re Hirao*, 190 USPQ 15 at 17 (footnote 3). See also *In re Thorpe*, 227 USPQ 964, 966; *In re Luck*, 177 USPQ 523; *In re Fessmann*, 180 USPQ 324; *In re Avery*, 186 USPQ 161; *In re Wertheim*, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and *In re Marosi* et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in " product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above case law makes clear. See also MPEP 2113.

Claims 29, 30, and 33 do not distinguish over the Chen and Oashi references regardless of the process used to form the damascene opening, because only the final product is relevant, and not the process of making such as using an oxidizing agent to cause an oxidation injury and exposing the metallic layer to a reducing plasma.

Allowable Subject Matter

12. Claims 1-25 are allowed.

13. The following is a statement of reasons for the indication of allowable subject matter: the examiner is unaware of any prior art which suggests or renders obvious a fabrication process for a damascene structure which has an opening that is formed which exposes a metallic layer and causes it to be oxidized (by an oxidizing agent) such that a reducing plasma is then used to partially reverse the oxidation damage which is followed by a cleaning process and the formation of a metallic plug.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quinto whose telephone number is (571) 272-1920. The examiner can normally be reached on M-F 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KVQ